

NIDIS Weekly Climate, Water and Drought Assessment Summary

Upper Colorado River Basin

January 1, 2013

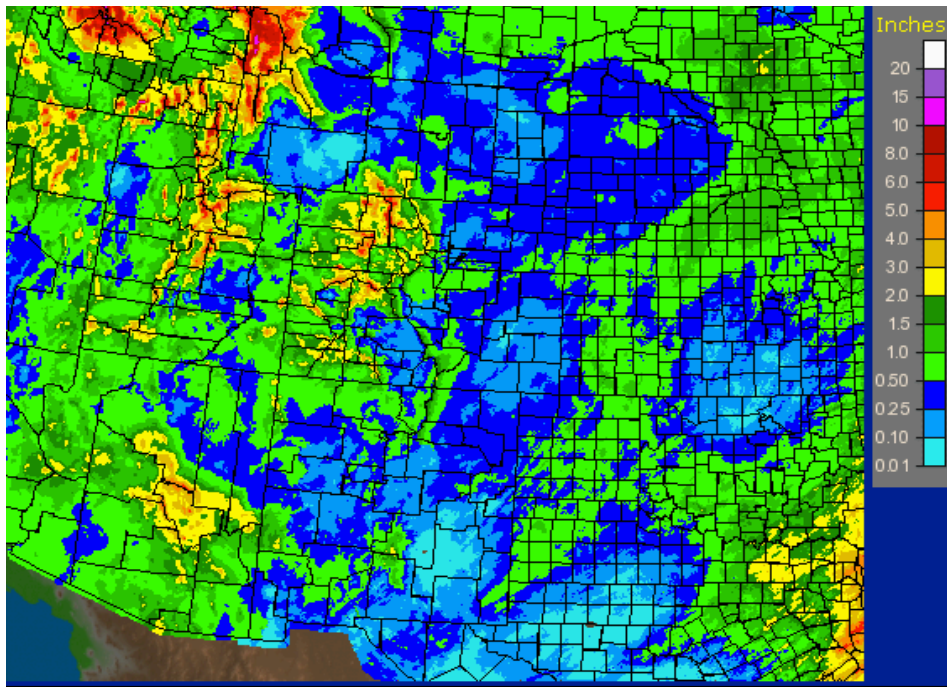


Fig. 1: December month-to-date precipitation in inches.

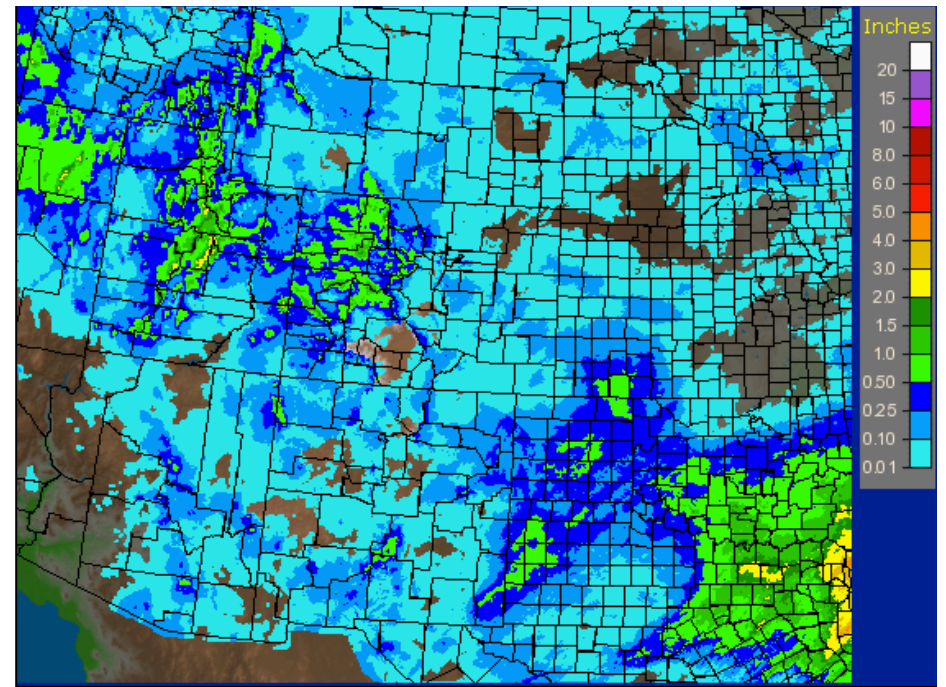


Fig. 2: December 24 – 30 precipitation in inches.

Precipitation

For the month of December, the Upper Colorado River Basin (UCRB) has received around a half inch to inch of moisture in the lower elevations and more in the higher elevations (Fig. 1). Areas of the northern and central Colorado mountains, the higher elevations in western Wyoming, and along the Wasatch and Uintah ranges in Utah have received between 2 and 6 inches of precipitation for the month. This is about average for this time of year, but has been a welcome relief for areas that were much drier than average during October and November. East of the basin, the rest of CO received between .25 and 1.0 inches for the month.

Last week, the heaviest amounts of precipitation were concentrated over the higher elevations in the UCRB (Fig. 2). The central UT mountains and the northern and central CO mountains received between .5 and 1.0 inches of precipitation, while the lower elevations throughout most of the basin received less than .25 inches for the week. East of the basin, most of eastern CO received less than .10 inches of moisture for the week, with some isolated areas seeing up to .25 inches.

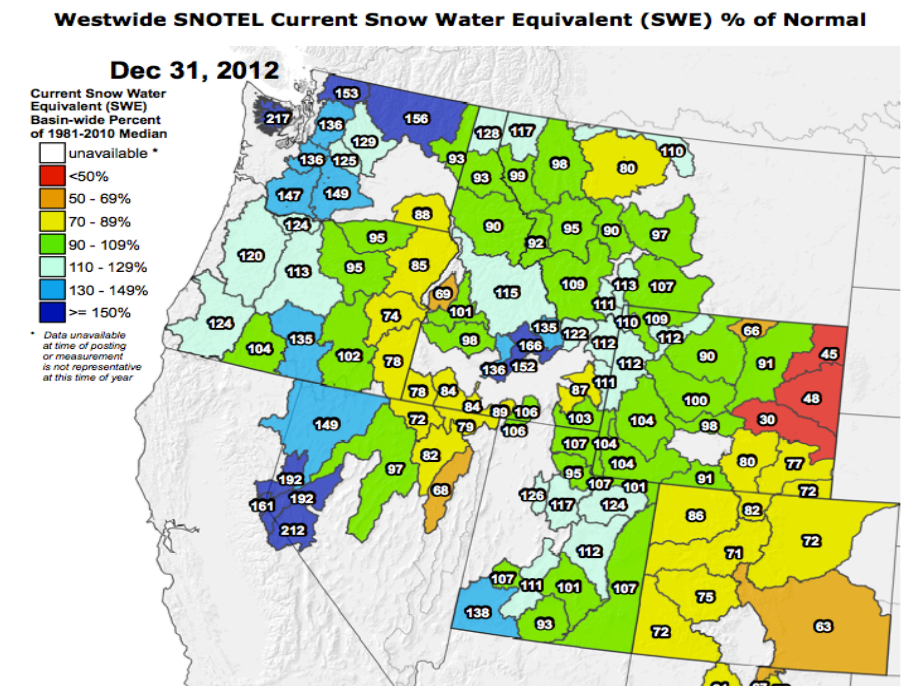


Fig. 3: Basin-averaged snow water equivalent as a percent of average, as of December 31st.

Snowpack

Accumulated snowpack is currently less than normal on the east side of the UCRB and near to above normal on the west side of the basin (Fig. 3). Sub-basins in western CO are all between 70% and 85% of normal snowpack. Northeast UT and southwest WY basins are around 100% of normal snowpack (with a few sub-basins in UT greater than 110% of normal). Snowpack in western CO has seen large improvements since the beginning of December, with all sub-basins improving by 30% to 40%.

The Colorado headwaters region is one of the sub-basins to show large improvement over the past month (Fig. 4). Early in the water year, very little snow was accumulating in that region, leading to a deficit of over an inch by the beginning of December. The month of December has seen large snow accumulations, so that the Colorado headwaters region is no longer showing a deficit and is very near average now for this time of year.

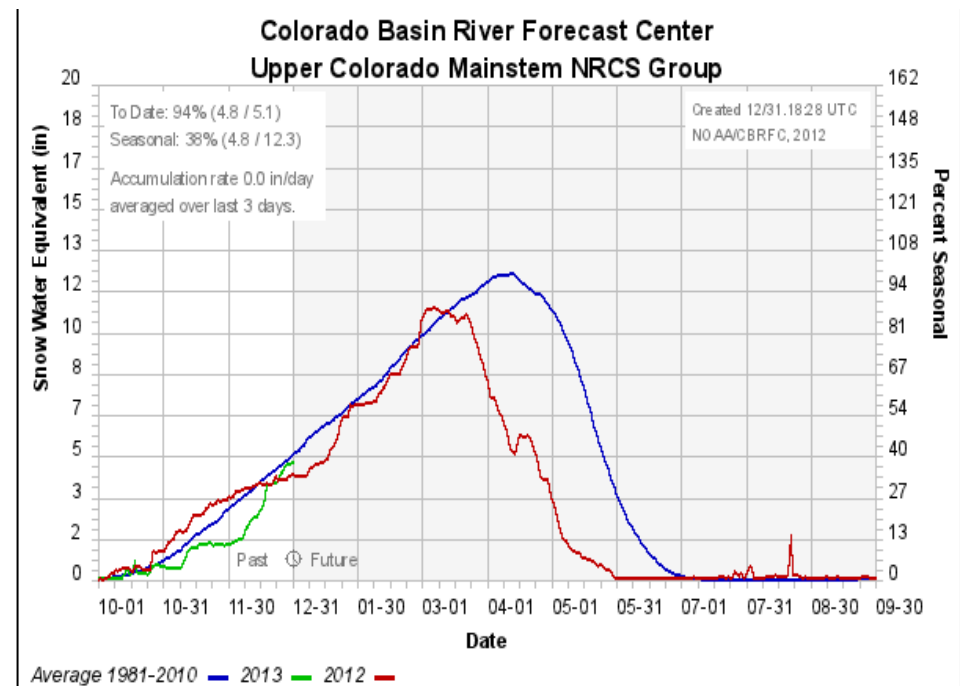
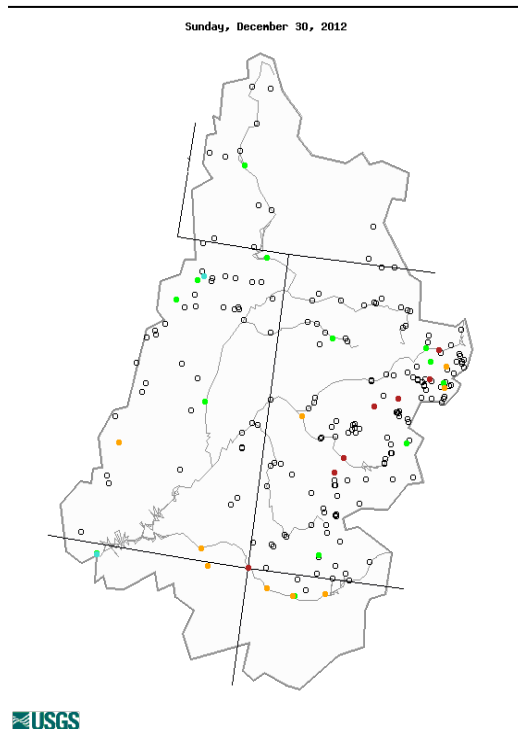


Fig. 4: Snow water equivalent over time for the Colorado headwaters region, compared to last year (red) and average (black).

Streamflow

As of December 30th, about 48% of the USGS streamgages in the UCRB recorded normal (25th – 75th percentile) to above normal 7-day average streamflows (Fig. 5). About 23% percent of the gages in the basin are recording much below normal streamflows, and only one gage recorded above normal flows. Many of the gages throughout the basin are under frozen conditions, and the number of reporting sites has decreased from 74 gages one month ago to only 31 gages now.

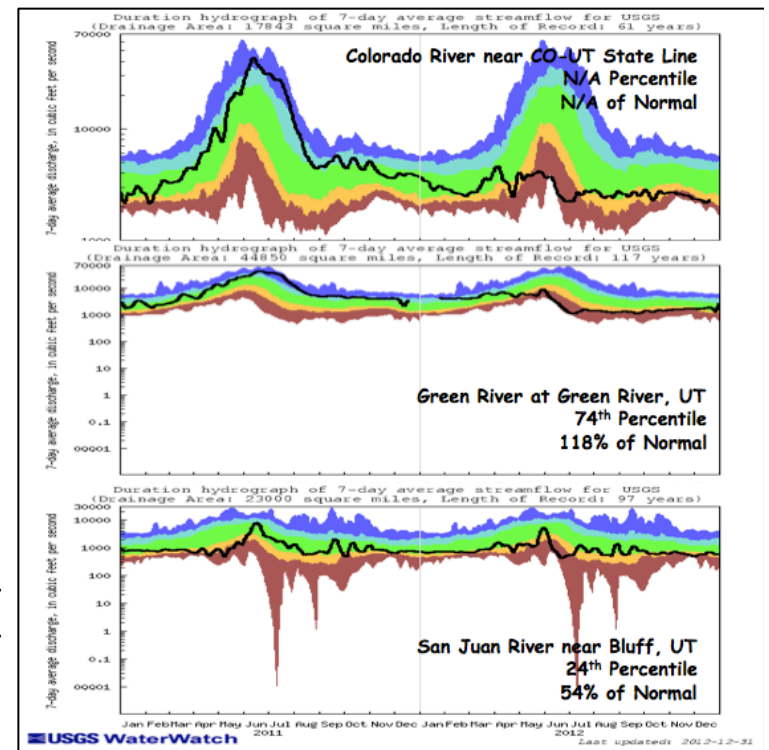
The three key gages across the basin are showing variable conditions (Fig. 6). Flows on the Green River at Green River, UT increased over the past couple of weeks and are currently above normal at the 74th percentile. Flows on the San Juan River near Bluff, UT have changed very little over the past couple of weeks and are currently in the below normal range at the 24th percentile. The Colorado River near the CO-UT state line gage has frozen over and is currently not reporting, though it had recently reported below normal flows.



Explanation - Percentile classes							
●	●	●	●	●	●	●	○
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Fig. 5: 7-day average discharge compared to historical discharge for December 30th.

Fig. 6: USGS 7-day average discharge over time at the CO-UT stateline (top), Green River, UT (middle) and Bluff, UT (bottom).



Water Supply and Demand

Last week, the UCRB experienced cooler than average temperatures, ranging between 4 and 12 degrees below average. East of the basin, eastern CO also saw much cooler temperatures, ranging between 4 and 12 degrees cooler than average for most of the state, with parts of northeast CO almost 16 degrees below average. The VIC soil moisture model shows dry soils through most of WY with near normal soil moisture in far southwest WY. Soil dryness is below the 20th percentile in eastern UT and much of western CO (Fig. 7). Western CO has seen improved soil moisture conditions in the last two weeks. Dry soils also show up in southeast CO and far eastern CO with near normal soil moisture in north-central CO and in the San Juan mountains in southwest CO.

For the month of December, most of the major reservoirs in the UCRB saw minor volume decreases, though Blue Mesa Reservoir saw a very slight increase since the beginning of the month. Volume decreases are normal for this time of year, and most of the reservoirs decreased less than what is normal. Flaming Gorge levels are near December averages while the rest of the reservoirs are between 60% and 80% of average.

Precipitation Forecast

The active pattern that has prevailed for the past couple of weeks over the region will continue over the next day or so, bringing more precipitation and snowfall to the higher elevations and concentrating over the southern portion of the basin through Tuesday (Fig. 8). Throughout the remainder of the week, a ridge of high pressure will build over the area bringing drier conditions with it. Temperatures are likely to remain cold, so expect cold and dry conditions into the weekend and beginning next week.

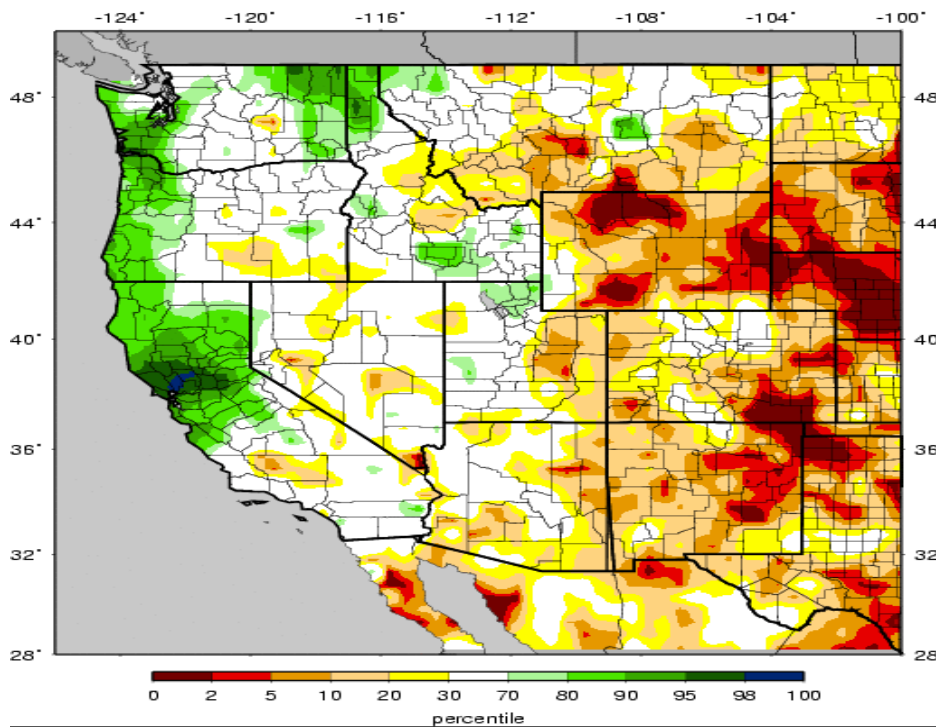


Fig. 7: VIC modeled soil moisture percentiles for the western U.S. as of December 30th. The map below combines soil moisture and SWE.

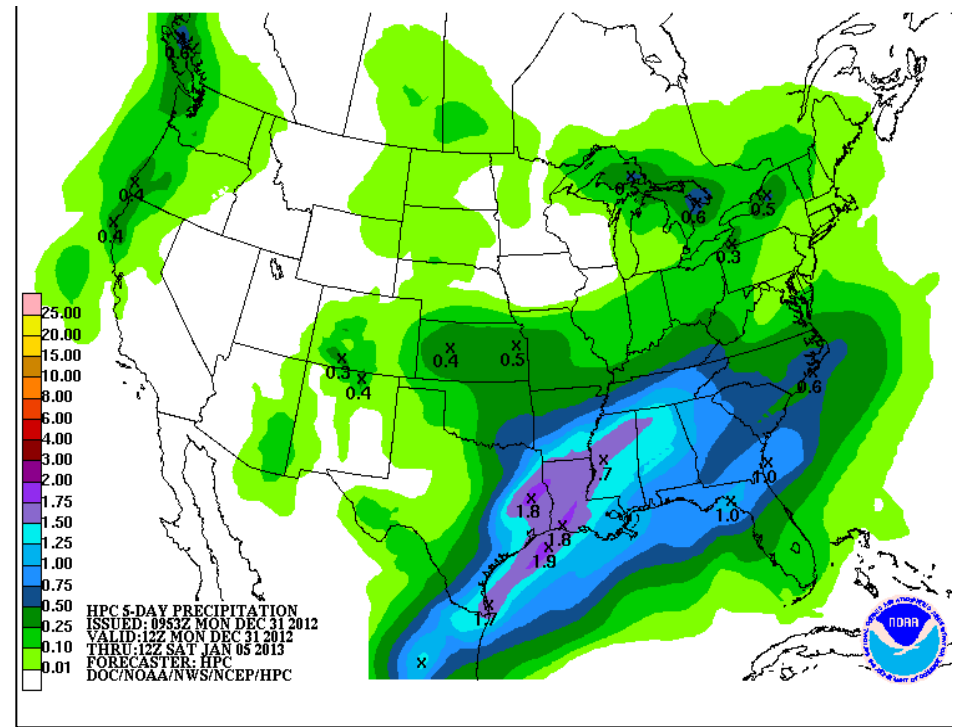
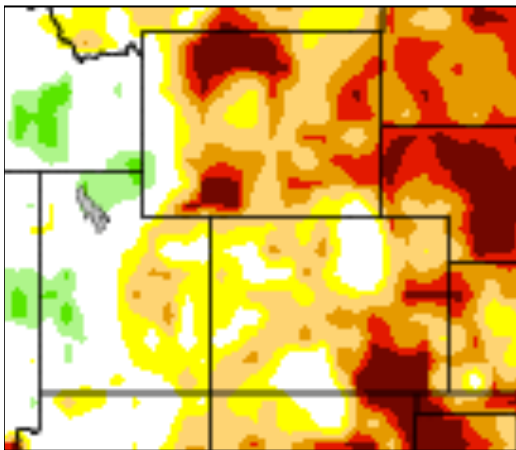


Fig. 8: Quantitative precipitation forecast (QPF) by the Hydrologic Prediction Center out to 12UTC Saturday.

Drought and Water Discussion

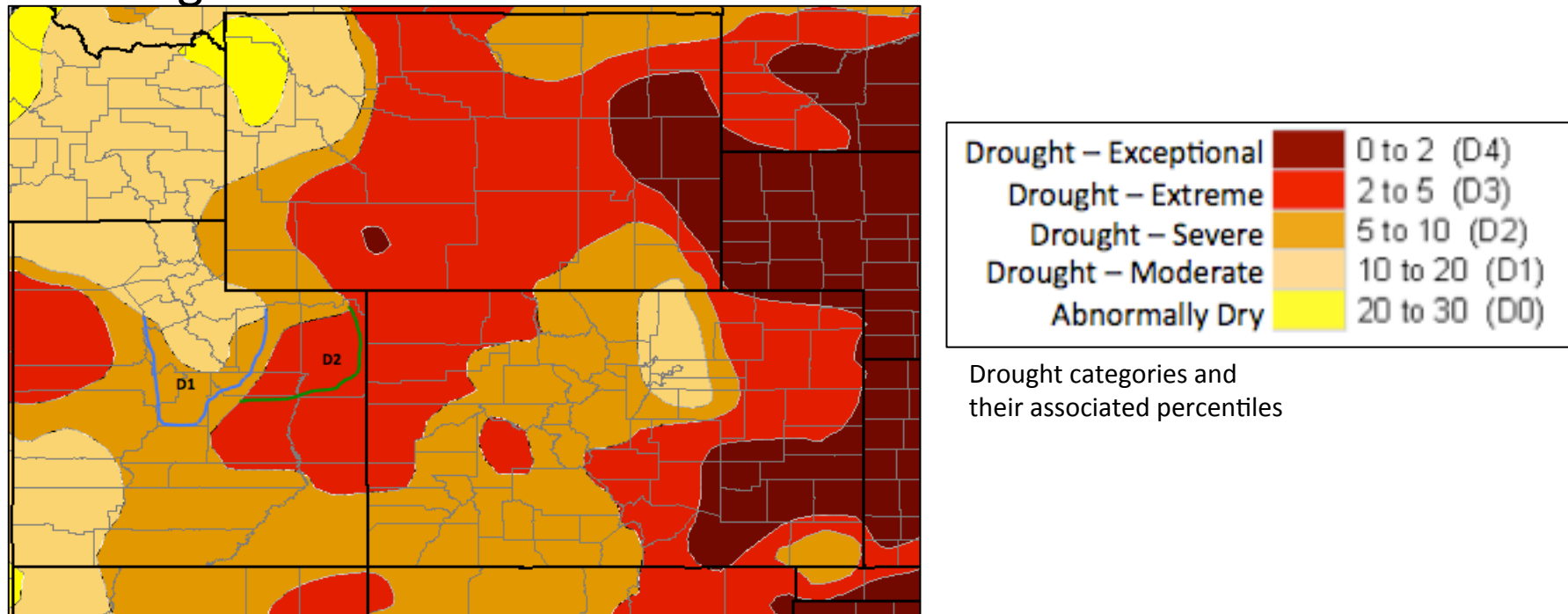


Fig. 9: December 25th release of U.S. Drought Monitor for the UCRB.

UCRB: The current U.S. Drought Monitor (USDM) author has made improvements in eastern and central UT in a recent draft of the USDM map (Fig. 9). In the higher elevations where water-year-to-date snowpack accumulations have been near to above average, the author has trimmed the D3 in the Duchesne basin (Fig. 9, green line), and trimmed the D2 along the Wasatch mountains (Fig. 9, blue line). Status quo is recommended for the rest of the UCRB.

Eastern CO: Status quo is recommended for the rest of CO in the current depiction of the USDM map.